

MACKENZIE VALLEY PIPELINE INQUIRY

Phase IV
PANEL I

INTRODUCTION

WITNESSES:

1. Dr. Charles Hobart

Exhibit #642

"Socio-Economic Overview of the
Mackenzie River Corridor"

2. Mr. Wayne B. Trusty

Exhibit #648

"A Review of Socio-Economic Studies
Undertaken by Canadian Arctic Gas
Study Limited"

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INTRODUCTION

TAB

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Socio-Economic Overview
of the
Mackenzie River Corridor

by

Charles W. Hobart

Presented to
Mackenzie Valley
Pipeline Inquiry



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Mr. Commissioner, in January I presented to this Inquiry a socio-economic overview of the Mackenzie Delta region. I have been asked to extend that overview to include all of the corridor along the Mackenzie River that would be directly affected by the proposed pipeline. While I again will be covering some of the ground that was covered a year ago by Drs. Helm and Stager, and on occasion will be reiterating some of the points that I made in Inuvik, I feel that the development of an adequate overview of the whole corridor at this time, will provide a context for the other evidence to be presented in this phase.

My personal acquaintance with the settlements of the middle and upper Mackenzie communities is much more recent and more brief than is my familiarity with the Mackenzie Delta communities. However, I have been involved in several research studies that focussed on this area and have studied the relevant literature.

Furthermore, the nature and the consequences of Euro-Canadian impact on the native people of the Middle and Upper Mackenzie regions are basically similar to those for the Lower Mackenzie Delta region, and the greater ethnic homogeneity of the regions south of the Delta make this area easier to comprehend. Comprehension is aided by the somewhat slower pace of change in at least the middle reaches of this area.

As in Inuvik, I must reiterate the diversity of the towns, hamlets and settlements which are scattered along the Mackenzie River corridor. About all that these fourteen settlements really share in common is their newness as established settlements, their Arctic or Sub-arctic environments, and their location in the main Mackenzie River drainage. Even their common newness is contradicted when one realizes that from a historical perspective they range in antiquity from Ft. Simpson, whose ancestral Fort of the Forks was established over 170 years ago, to Inuvik whose site was first permanently occupied less than 20 years ago.

But, despite this diversity there are certain characteristics common to virtually all of these communities, from the largest to the smallest, which we may quickly note. The first is the extreme recency of permanent settlement of all their current populations, native and white. Most native people did not settle down in large numbers in these communities until about 20 or 25 years ago, and the arrival of very many whites is yet more recent. The second, is that they have very young populations, no more than 12 percent being over 50 years of age. This is a result both of the high birth rates in recent years of the native peoples, and of the youthfulness of the white in-migrants, who have come in recent years.

A third characteristic of these communities is their heavy dependence on government sources of income, either in the form of Federal or Territorial government payrolls, or in the form of transfer payments. According to figures collected

in the 1969-70 Territorial Manpower Survey, these government sources provided at least 50 percent of the income to all of the communities under consideration, excepting only Norman Wells and Arctic Red River, and no less than 72 percent to Ft. Simpson. There are no more recent published data to my knowledge on this issue. The Manpower Survey data are relevant to the context in which there is little exploration employment.

I should note that the low proportion of governmentally provided income in Norman Wells probably is accurate in view of the refinery and ancillary employment in that settlement. The Arctic Red River figures may or may not be accurate given the inadequacies in the data for Indians collected during the Manpower Survey.

The communities in question fall naturally into three clusters: those of the Upper Mackenzie, lying south of Wrigley; those of the Middle Mackenzie, lying between Arctic Red River and Ft. Simpson; and those of the Mackenzie River Delta. The distinguishing and common features of the three larger communities in the Upper Mackenzie - Hay River, Ft. Simpson and Ft. Providence - include their common historical antiquity as Indian-white contact points for well over 100 years, their highway accessibility to the South, their status and non-status Indian (rather than Inuit) populations, and their relatively large proportions of white residents, ranging to over 75 percent in the case of Hay River. The highway provides access not only to the other communities scattered around the shores

of Great Slave Lake - Yellowknife, Rae-Edzo, Ft. Resolution - but also to the large metropolitan areas of Alberta - Edmonton and Calgary - less than 1,000 miles down the rather heavily travelled road. All of these settlements have liquor outlets and have had for the past seven years.

Jean Marie River, having an almost exclusively native population of less than 50, and without a highway location is of course quite different, and yet it is secondarily accessible to the influences which are primarily accessible in the other three communities. The river serves as the highway for Jean Marie residents providing easy access to Ft. Simpson, about 40 miles downstream. In addition there are relatively frequent charter flights into the community, typically under government auspices. These flights often accommodate local residents if there is space available.

If Norman Wells is excluded, the similarity of the settlements of the Middle Mackenzie - Ft. Wrigley, Ft. Franklin, Ft. Norman, Ft. Good Hope - makes this the most homogeneous of the three regions. These communities are all of a similar size, ranging from Wrigley with a population of about 215, to Ft. Good Hope with a population of 420. All have predominantly native populations (comprising about 85 percent or more of the total) of virtually exclusive Indian ancestry. All have settlement status with the exception of Ft. Franklin which has hamlet status. All are dependent on river or small aircraft transportation. None have liquor outlets, although liquor is very commonly imported into all four, if not on

flights specially chartered for that purpose, then on scheduled flights, which visit all four regularly. The existence of liquor stores at Ft. Simpson, Norman Wells, and Inuvik means that all of these settlements are within about 100 air miles of such outlets.

Norman Wells is of course atypical, a white man's town having only about one-quarter native population. Substantial employment is provided by the refinery and the ancillary developments which it necessitates. Expected southern "amenities" are available here including a cocktail lounge and a liquor store. It is noteworthy that although a permanent settlement "cluster" became established here about 30 years ago, it has not attracted a sizeable Indian satellite community.

The Mackenzie Delta is the most diverse of the three sub-regions under consideration. It is heterogeneous in terms of antiquity of settlement, of ecological setting, of ethnicity and "mix" of settlement populations, and of sources of community income. Because I reviewed this area in detail during my testimony in Inuvik, I shall not repeat that material here, unless requested to do so.

In the remainder of this statement, I shall briefly review the most salient points relating to the history, culture, demography, social interaction, economy, education and drinking and violence characteristics of this admittedly long and diverse Mackenzie River corridor region. I shall make limited reference to the Mackenzie Delta community, as I have noted.

History

The most important aspects of the historical development of contacts between Euro-Canadians and native people in this Mackenzie corridor were well reviewed by Drs. Helm and Stager a year ago, and by several others since then. Thus I shall presume this background and restrict myself to a few observations on the changes that have taken place.

Ft. Simpson was established in 1804, Fort Good Hope in 1805, Fort Norman in 1810, and Fort McPherson in 1840. Steamboats began running the length of the Mackenzie River as early as 1887, displacing the York Boats and providing some employment for steamboat crewmen, wood cutters, etc. This development reduced the costs of freighting goods to the more northerly posts and this, together with some influx of "free traders" reduced the cost and increased the variety of trade goods. However, the general impact of these developments was slight. The by-now well established traditional cycle of life during this Fur and Mission Era continued essentially unchanged, little modified by these or other developments.

The slowness of basic change is further suggested by the fact that there were fewer than 150 white people in all of the Northwest Territories as recently as 1901. It was not until 1903 that the Northwest Territorial Mounted Police began to make patrols in the Territories.

While Treaty Number Eight was signed with the Indians living to the south of Great Slave Lake in 1899, this develop-

ment too was relatively inconsequential. The benefits that the Indians received under this treaty - fish hooks, twine, ammunition, medicines, cash - were minimal and had insignificant effects on the people's way of life. Although the treaty provided for reserves this provision has not been implemented except at Hay River. Perhaps the only effect of the treaty was that since it was seen as a "peace" treaty the Indians refrained from trying to obstruct the entry of the whites who came in throngs at the time of the Klondike Gold Rush.

Activity along the corridor during the 1920's and 30's increased relatively slowly, with only a gradual impact on the lives of the native people. The first regularly scheduled airline flights down the Mackenzie River began in 1929. Oil was refined at Norman Wells starting in 1931. The opening of the Yellowknife and Echo Bay mines resulted in a four-fold increase in barge traffic north of Fort Smith in the 1930's.

World War II saw the beginning of a number of developments which further opened up the north and set in motion those processes which have now resulted in the resettlement of virtually all of the population in the communities of the region. The building of all weather air strips at a number of locations down the Mackenzie Valley in support of the Canol project laid the foundation for the expansion of scheduled flights and for increased charter flying in this area.

After the War the slump in the price of furs and the rise in the prices of trade goods disrupted the equilibrium of the Fur and Mission economic system. Increased access to

and information about the North made more information about Northern natives generally available in the South just at the time that their situations were worsening. As a result, government programs, first in the areas of health and education and then with respect to housing, were drawn up and implemented. The increased attractiveness of settlement life for native people, resulting from the presence of nursing stations and of children in school during the middle and late 1950's, was vastly increased by a variety of low cost housing programs which became available in the early 1960's. As a result, by the end of this decade the land generally was depopulated of permanent settlers, and the life of the native people in the North had become essentially community based although many of course continued to spend a great deal of time out on the land.

The years since the Second World War must be characterized as a time of accelerating social change in the Mackenzie Corridor. The minimal exposure of native children to formal education in the late 1940's has now given way to nearly universal enrollment of children in school. This has inevitably been associated with a decline in trapping and land-living skills, and, together with settlement living, has resulted in greater dependence on wage employment, and on unearned income.

If the decade of the 60's can be described as the time of population redistribution and community settlement, the decade of the 70's must be referred to as the age of highway travel and electronic communication. The highway from the

South had been built through to Yellowknife in 1961. 1971 saw the completion of the extension from Ft. Providence to Ft. Simpson, and most sections of the road have now been completed to within fifty miles of Wrigley. The Dempster Highway from Dawson to Ft. McPherson at the south end of the Delta is scheduled for completion in 1977 and the road from Ft. McPherson to Inuvik is complete except for the ferry. The Liard Highway, from Ft. Simpson to Ft. Nelson is about one-third completed.

The Anik communication satellite was launched in 1972 and five of the communities are now able to receive live television broadcasts, providing them with what Professor Stager described as a window in their living rooms looking in on the Southern Canadian way of life. The demographic data, and the data on high school enrollments that I will present, round out a picture of a region which has now entered upon a phase of accelerating social change.

Culture

It is evident from the historical review, that the period of continuous culture contact has resulted in cultural change throughout the area under consideration.

In some areas, there have been periods of intensive interaction and rapid change: along the Arctic coast between Herschell Island and Baillie Island during the 15 year presence of the whalers about the turn of the century, more

recently in the vicinities of Hay River and Ft. Simpson, with the development of Hay River as a transportation hub, the opening of the Pine Point Mine, and the building of the Yellowknife, Liard and Mackenzie River highways, and throughout the region during the past five to seven years with the oil exploration boom.

However, for most of the culture-contact period and across most of this region the pace of change has been much more slow, but nevertheless steady. With the establishment of trading posts during the first half of the 19th century, the people of the area became dependent on the posts, primarily for tools and utensils, but also for flour, lard, tea, sugar and tobacco. For these they traded furs, and their fur take was shaped to meet these rather modest needs. Their life on the land, in terms of transportation, housing and clothing was virtually identical with life in pre-contact times, excepting, of course, the in-gathering to the post and the mission which occurred several times a year. This period marked the beginning of the dual economy, involving dependence on subsistence from the land but harvested with the assistance of trade goods from the post, which Helm has described. While there was continuous gradual change as a result of many innovations and adjustments on the part of the native people, the basic tenor and the major activities of their lives were but little changed. Except for the white introduced disease epidemics, there was no severe disruption of their lives.

The presence of "free traders" in competition with the

Hudsons Bay Company after 1901 and the increased variety of trade goods which they offered broadened the cultural impact. The very high prices that furs commanded during the 1920's and to a lesser extent during the 1930's tended to further accelerate this acculturation process, although the Dene throughout most of the region were not as responsive to the new opportunities which became available as were the Inuit in the North.

However, the opening of the mines in Yellowknife in the 1930's, and the building of the airstrips, the Canol road and pipeline in the 1940's had further impacts. Thus when the economic disruptions caused by falling fur prices and rising trade good prices at the end of the World War, were added to the increased availability of health care, schooling and, somewhat later, low cost housing, the people moved into the settlements. The old way of life of the Fur and Mission period, was ended.

In the Inuvik hearing I introduced the Honigmann's conception of "frontier culture". It is reflected in an assortment of outdoor-type activities - hunting, trapping, bush-living - together with the requisite material culture and behavioural patterns, and in divergence from dominant, middle-class North American cultural norms relating to drinking, marriage, respect for law and the police and so called "respectable" patterns of behaviour.

There are a number of centres south of the Delta which must be seen as spawning grounds of local variations of this

frontier culture: Ft. Simpson, Hay River, and more recently Yellowknife and Norman Wells, as well as Aklavik in the Delta itself. These settlements have been the crucibles in which Indians and Metis have interacted with Euro-Canadian traders, prospectors, miners, sailors, construction crews, casual adventurers and missionaries.

The frontier culture emerged, locally and regionally, as a product of this interaction. From these centres it was inevitably carried to outlying native camps. It is now generally characteristic of the smaller, predominantly native settlements of the region as well as of the "old town" portions of Hay River, Yellowknife and Ft. Simpson.

In the smaller, native settlements this frontier culture is often seen in the drinking patterns, the marriage patterns, the attitudes toward the handling of violence, the attitudes towards law, towards officialdom and towards relations between men and women. These patterns cannot be directly traced back to the aboriginal cultures of this region, although of course the aboriginal cultures have contributed significantly to the frontier culture. The patterns are a product of the cultural melting pot that the North became in the years between 1900 and 1950. Other patterns such as the continuing emphasis on the sharing of "country" food are of course directly derived from traditional values.

After 1950 the "period of planned development" began in earnest: a multitude of government programs followed. The number of federal government employees working in the Terri-

tories increased eight-fold to about 1,200 in the 15 years preceding 1967. School attendance increased about ten-fold, to 90 percent of those eligible, during the same period. The implicit goal of the first 20 years of this Period of Planned Development, from about 1950 to about 1970, was to impose southern values on the native people of the Territories, undercutting many aspects of their own culture. It is most obviously seen in the approach to education, but it was also seen in the approach to law and justice where, by contrast with Greenland, there was little attempt to extensively temper Canadian law and legal penalties in order to reduce their disparities with native tradition. It was also seen in the approaches of Northern Service officers, of Settlement Managers and of the many specialized personnel who were sent in, typically with little if any orientation to the significance and effectiveness of the ways of the people they would be dealing with. The power of these men in eliciting or blocking proposals for government grants and government projects, together with their obvious relative wealth, and the similar wealth of most whites whom natives encountered, could not but reduce the native appreciation of things native, and vastly and often unrealistically enhance their appreciation of things white.

The resulting precipitous acculturation is seen in the tendency of most natives in the Territory to discard native canoes and kayaks, tools of native design of many kinds and dog teams in some areas, long before comparably situated native

peoples in Alaska and Greenland did so. It must be noted that the period of intensive contact with whites was typically as long or longer for the Greenland and Alaska natives than is the case with native peoples of the Northwest Territories. However, the contact among the former was not as massively destructive of appreciation for things native as it has been among the Canadian Inuit and Dene.

A further consequence of these same influences, together with the decreasing economic attractiveness of living on the land, is seen in a certain ambivalence among many native people toward both the settlement and the bush. The trading post and its offspring, the settlement or town, has always been "white man's country", and accordingly both attractive and repellent. The attractions were the goods, the comforts, the stimulations of settlement-centered festivity and the liquor. At the same time there were imperfectly understood threats and dangers associated with the white man's law and police officials, the quick loss of hard-earned money, and the threats to pride and self-esteem that were often experienced at the hands of insensitive or prejudiced whites.

Similarly, the bush is attractive because it is symbolic of a well-known and well-liked traditional way of life, exploiting a familiar terrain for known fur, meat and fish resources, in the company of well-known and non-threatening companions. It is also attractive as a haven from the more enervating aspects of settlement life. However, by contrast with the current ease of life in the settlement, life in the

bush for many months of the year is harsh, comfortless and, especially for the less well initiated, distinctly dangerous at times. The returns from trapping for all but the last few of the post-war years, have generally been very slim and never very dependable. Thus it is inevitable that for many, wage employment must be more attractive than trapping, as a source of livelihood. I shall return to this topic in the Economics section later.

The years since about 1969 to 1970 have seen at least a formal commitment to a new approach which might be termed a Partnership Developmental Approach, involving a partnership between Northern natives and the essentially white governments. Examples of this new approach are many: the willingness of the Federal Government to fund the organizational and operational expenses of the various native peoples' organizations; the project developing northern relevant curriculum materials in the Territorial Department of Education, begun under Mr. Paul Robinson; the consultations which are mandatory with Settlement Councils before oil and mineral explorations can begin in the vicinity of a settlement; the discussions which Gulf Oil Canada had with the Settlement Council and the people of Coppermine prior to the initiation of their Coppermine Employment program; the periodic discussions which Imperial Oil now has with the Tuktoyaktuk Settlement Council in regard to the operation of their base camp at Tuktoyaktuk. The Community Hearings which this Commission has been holding in communities in the proposed corridor area provide another

example. To what degree this Partnership approach will turn out to be profoundly consequential, or to what extent it will turn out to be a series of token examples, remains to be seen; cases of both can be cited at this time. Some charge that consultations with Settlement Councils have little more than token significance. The Community Hearings of this Commission have undoubtedly been very consequential.

Unfortunately, the Partnership approach comes on the heels of two decades of an approach emphasizing acculturation. The result is that in many cases the native leaders who are being involved in partnership contexts are themselves the product of "whitewashing" treatment in schools and other white dominated Northern contexts. The consequence of this treatment is the ambivalence noted earlier toward many aspects of the white way of life which are attractive and desirable in some ways, but unattractive and undesirable in other ways.

What the long lasting consequences of this new stage will be, only time can tell. However we can be very sure, at this time, that one consequence is definitely a new and much more prideful sense of native identity, and a new sense of purpose, and of determination to achieve goals which have been set.

Demographic Aspects

This section was covered in some detail during my testimony in Inuvik. Since I am primarily dependent on data for

the whole of the Territory, there is little that I can add that is specific on a sub-regional level. Accordingly, I will simply reiterate briefly the essential conclusions.

Data for the past 50 years clearly indicate a rapid increase in the total population of the Territory - almost a three-fold increase between 1921 and 1951. The native population also increased rapidly despite the high disease rates which persisted, to a diminishing extent, through the 1960's. The Indian population increased by 85 percent between 1921 and 1971, while the Inuit population increased by no less than 250 percent. I am confident that the explanation for the large differential between these two groups is that many Indians moved into the "other" category, through non-status Indian paternity or renunciation of treaty status. It should be emphasized that no such alternative classification existed for the Inuit. Among the latter, children of non-Inuit fathers typically acquired "disk numbers" and counted as Inuit.

The "other" population, including Metis, non-status Indians and whites, showed an expected rate of increase between 1921 and 1931, but then increased by over 150 percent between 1931 and 1941 probably in considerable part because of the immigration of whites. It was during this decade that the Yellowknife and Echo Bay mines were opened. Between 1941 and 1951 the "other" population doubled, no doubt reflecting continuing white immigration, and in the following decade it almost doubled again. Between 1961 and 1971, the decade during which the Territorial Capital was moved to Yellowknife,

the "other" population increased by 6,000, a 60 percent increase.

When I inquired of the Metis Association, I was told that they are currently unable to provide an exact figure for the total number of Metis and non-status Indians in the Territory, but they estimate that there are about 10,000. They are currently involved in making a demographic survey and expect the results of that survey to be available shortly. The estimate seems plausible. If one assumes that about 60 percent of the 853 "others" enumerated in 1921 were Metis and non-status Indians, and that the rate of increase of these people together with the Treaty Indians was slightly lower than that of the Inuit in the following half century, then there should be between 9,000 and 10,000 more Indian origins people in the Territory than the 7,180 status Indians reported in the 1971 Census, in other words, a total of 16,000 to 17,000. Although the data do show that the Inuit have had higher birth rates than the Indian, and the "other" have had the lowest of all, the infant mortality rates for these groups have shown the same pattern - in 1960 the Inuit infant death rate was twice the Indian rate. Thus the disparities between the number of surviving infants per 1,000 population were reduced between these groups.

The birth rate statistics in the Northwest Territories as a whole demonstrates a cyclic pattern. They show a rise, from a low of about 20 live births per 1,000 population in 1931, which increased by 1947 to about 40 per 1,000, and

peaked at almost 50 per 1,000 during the years 1960 to 1964. The birth rate declined thereafter, to 40 in 1970 and 27.8 in 1974, the most recent statistics available.

Detailed birth rate statistics by ethnic group show the Delta Inuit have lower birth rates than do their fellows in the other Arctic coastal settlements. A parallel contrast existed in 1974 between the Delta and the Southern Mackenzie Dene. The statistics also show that during the period from 1970 to 1974 the "other" group has changed from the group with the lowest, to the group with the highest birth rate. This is explained by the fact that a substantial proportion of this group is the white component which is heavily composed of young couples having the highest reproductive potential.

These data would seem to call into question how long native people will continue to be in the majority. If we make the probably conservative assumption that about 8,200, or half, of the 1974 "other" population is Metis, the native peoples comprised 78 percent of the population in that year. The birth rate of the native people in the Territories declined by approximately 45 percent between 1968 and 1974, while the birth rate of the "others" has fallen by no more than 10 percent. Indeed if we had accurate birth rate figures for the white component, with the Metis and non-status Indian component removed, the white rate would probably show an increase.

In fact the increase in the white birth rate, relative to that of the native people, may have little effect on the ethnic composition of the Territorial population. Since many of the young whites are in the early stages of their work and professional careers, promotion probably will mean movement out of the Northwest Territories. However, with declining birth rates the native people will be less able to match, through net reproduction, the increase in the white population that takes place through in-migration.

Of more immediate relevance is the fact that, as a result of the high native birth rates since World War II, unusually large numbers of native young people have begun entering the job market. Those born during the peak period are now 10 to 15 years of age. Not only will these "baby boom" young people continue to enter the job market in large numbers for the next 20 years but, as they become parents, they will produce their own bumper crop of babies. Even though the birth rate continues to decline, these large numbers of people will be in their most reproductive years. This is a far cry from the situation during the 1950's when no less than 10 percent of the total Canadian Inuit population were in tuberculosis sanatoria, with corresponding handicapping of the ability of that population to reproduce itself. The availability of, respectable, meaningful, gainful employment for this young and rapidly growing population must be a matter of very great concern.

Social Aspects

In this section we shall try to present an overview of the nature of the interpersonal relationships of Euro-Canadians and native people in the corridor under consideration. The most relevant concepts in this discussion are native autonomy versus submissiveness and dependency on whites, the intrinsic value of native lore, crafts and skills, and prejudice and discrimination, topics that I discussed in my presentation in Inuvik. I am confident that virtually all that I said there, in respect of the Delta, applies to the rest of the Mackenzie corridor, as well.

Generally the post-contact history of native people in the Mackenzie Basin has been a history of growing dependency on whites. During the early trading period, although native people became dependent on traders for continuing supplies of utilitarian (as well as non-utilitarian) trade goods, there were long periods when they were out on the land where they were relatively autonomous. During the Fur and Mission Period their dependence on goods from the south increased. However, many had the wealth, particularly during the 1920's and 30's, to command these goods in comfortable supply and, while the fur market remained high, many of the trappers were "masters of their fate". But the early Period of Planned Development witnessed a rather sharp reversal as many became dependent on government, for welfare money during at least part of the year, for housing, for services and often for jobs as well.

The steady, and increasingly rapid erosion of the value of native lore, crafts, and skills that I described in Inuvik, is characteristic of the central and upper Mackenzie region as well. While early contact with whites sustained the value of the native lore and the skills which permitted travel and survival, often in comfort, today Arctic mechanized technology, and increased dependence on air travel, have made traditional survival lore and skills increasingly irrelevant. The result has been the massive devaluation of things native and of more traditional aspects of native life, which was remarked by Van Stone among the Indians around Snowdrift, and by Clairmont among the young natives of Aklavik and Inuvik, fifteen years ago.

This process lead inevitably to a loss of respect or worthiness by the native people, both in the eyes of whites and in their own eyes. The building of new towns, at Hay River, Yellowknife, Inuvik, has intensified this process. When whites first came to the North, there was a basic similarity in the living and survival patterns of everyone in the same community. As I noted in Inuvik, in the "old towns" the "honey bucket" was the great equalizer.

Today, in some areas, and Inuvik is perhaps the most flagrant example, the shift from the old town to the new town has been associated with a shift from integration to considerable segregation, from acquaintance and acceptance to lack of contact and prejudice, from informal to formal relationships between natives and whites. However, somewhat different

patterns are found in other towns in the Territories. In Hay River there are the effectively segregated West Channel and Indian Reserve communities, self-segregated in the latter case. But there is also the low cost housing development locally referred to as "Disneyland" where native people are integrated with whites. And here in Yellowknife native people are found in the low-cost housing which is widely scattered throughout the town.

I spoke in Inuvik of the contrast between the trader's vested interest in native competence and the vested interest of government officials with "client serving" responsibilities, in the incompetence and dependency of natives, and of the biased perceptions of natives that officials are prone to acquire. According to Parsons research in segregated communities, and de facto segregated work situations, whites tend to share and reinforce these attitudes in each other, and natives must increasingly experience the effects of this process. To the extent that "new towns" become more segregated they tend to become centres of this "infection", which is communicated most consequentially to natives and to a lesser extent to whites, visiting the larger new towns from the smaller settlements. Only increased collegial and co-worker relations will set in motion counter-influences of mutual understanding, appreciation, and respect. Fortunately, the fact that there are some signs of emergence of a Partnership association between native and white people suggests that the pendulum is now swinging in the other direction.

Economic Aspects

The data I want to present in this section deals with what is known about family income in the Mackenzie corridor. I shall not enter into any technicalities of economic analysis.

The period that is of particular interest to us, is the period since World War II. Prior to that the dual economy of the native people, involving dependence on the land for subsistence and on the trader for the tools to harvest the resources of the land, worked pretty well, and some natives became quite affluent. But this collapsed after the War, as fur values dropped and the prices of goods rose. The resulting generally hard times were only brought to an end by increasing employment opportunities in the late 1960's, triggered primarily by rapid expansion of oil exploration activities.

The analyses of the income data from the 1969 and 1970 Canada Manpower Study in the Northwest Territories, published by John Palmer and C.Y. Kuo, and the relevant data from the Gemini North field surveys provide the best sources for family and per capita income in the region, despite the fact that the Territorial Manpower Survey data are now somewhat outdated. The latter also has some limitations in terms of incompleteness of the survey data for some groups. Dr. Kuo reports that survey returns were obtained from 96 percent of Inuit, 73 percent of the Indians, and 62 percent of the Metis and whites (combined) in the Mackenzie District. The advant-

age of the data is that mean per capita income can be calculated by ethnic category. Thus, the mean per capita income for Inuit in the Mackenzie District was \$840, for Indians it was \$667, for Metis it was \$1,147, and for whites it was \$3,545.

Both the Territorial Manpower Survey, and the Gemini field surveys, reflect very heavy dependence on income from government sources in most northern communities. Thus income from government employment exceeded 50 percent of the total community income in Ft. Simpson, Wrigley, Ft. Norman and Inuvik. It exceeded 40 percent in 8 of the 14 settlements, and it was less than 20 percent in only three communities; Ft. Providence, Norman Wells, and Arctic Red River. Transfer payments accounted for about one-third or more of the community income in Ft. Providence and Jean Marie River. Only in four communities, did transfer payments comprise less than 10 percent of the total: Hay River, Wrigley, Norman Wells and Inuvik. Transfer payments and government employment income jointly accounted for more than half of the community income in all but two communities - Norman Wells (6%) and Arctic Red River (30%) as we noted earlier.

Examination of data on mean family incomes from all sources, from the Territorial Manpower Survey indicates that in two-thirds of the communities at least 40 percent of the families earned less than \$2,000. In Ft. Providence and Jean Marie River this proportion was more than 65 percent.

Only in the three heavily white communities, Hay River, Norman Wells and Inuvik, were fewer than one-third of the families in this low income category.

Data on native mean per capita earned income for 1969-70 from the Territorial Manpower Survey shows that half of the communities had per capita earnings of less than \$700 and three had no more than \$500. Four communities had such earnings in excess of \$900; Ft. Simpson, Arctic Red River, Inuvik and Aklavik. In general, the data indicates that, in terms of earned per capita incomes the native population was best provided for in the Delta and in the two largest settlements in the south, Hay River, and Ft. Simpson, while the two poorest communities were Jean Marie River and Ft. Providence. All of the native communities between Ft. Providence and Ft. McPherson, with the exception of Ft. Simpson and Arctic Red River, were distinctly impoverished according to these data.

It is interesting to note that a comparison of these 1969-70 results with the Gemini North data for 1973, suggests that the relative per capita income situation in the communities has not changed very much. Generally, the low income communities in 1969-70 still had low incomes in 1973.

Indication of the size of the contribution from exploration employment to community income is provided by data on employment of Northerners in hydrocarbon exploration during the 1971-72, 1972-73, 1973-74 and 1974-75 employment seasons, as compiled by the Petroleum Industry Committee on Employment

of Northern Residents. Again it is not possible to differentiate between native Northerners and white Northerners.

Since most of this employment has been centered in the Mackenzie Delta, the farther south you go, the smaller the numbers of people who have been employed in this work. However, the average earnings per job tend to be fairly comparable in the Delta and the Middle Mackenzie areas.

Generally, these data show that exploration employment has made a substantial input into the income of many families in the Delta area. The input into the settlements to the south, while less, is certainly not insignificant. During the 1972-73 and 1974-75 seasons, almost a quarter of a million dollars flowed into the Middle Mackenzie settlements, and the average earnings per job in this area have risen from about \$2,000 in the first season to about \$3,000 during the 1974-75 season. In all, during the latter season, 553 men from communities along the Mackenzie corridor earned a total of almost \$2,000,000.

Relevant also to the economic situation in the corridor is the occupational structure of the area. Data are available from the 1961 and 1971 Canada Censuses, from the Territorial Manpower Survey, and from the Gemini North field surveys. The latter two appear to be the more reliable, because of the inability to separate out white respondents in the Census data, and the use of a "random rounding" procedure, introduced to protect anonymity, which makes the data for small samples unreliable.

The main points to be noted with respect to the Census data are the declines in trapping and the increase in the proportions of male respondents not stating an occupation. The data for trappers show a decline for the whole Mackenzie corridor from 17.6 percent in 1961 to 4.4 percent in 1971, and declines for the Delta, the Middle, and the Upper Mackenzie areas of from 5.9 to 4.2 percent, from 57.4 to 3.2 percent, and from 17.7 to 4.9 percent, respectively. The proportion of male respondents not stating an occupation increased by 13.4 percent in the whole of the Mackenzie corridor under consideration, and in the Delta, the Middle and the Upper Mackenzie, respectively, by 17.7, 17.1, and 8.1 percent, respectively.

I suspect that the increases in proportions of men not stating an occupation reflect, in addition to interviewer effect, the increased confusion of two groups in 1971. Older men who, when living out on the land, had been used to one pattern of hunting and trapping life in a sense may not have known what their occupation was under the changed conditions of settlement life, given the limited employment opportunities. Secondly, there was the uncertainty of young men who lacked any very consistent occupational pattern.

The DIAND Territorial Manpower Survey permits identification of the occupations of the native residents of the corridor area. According to these data, the proportion of trappers in the male labor force in the Delta was 17 percent, in the Middle Mackenzie it was 17 percent, in the Upper

Mackenzie it was 22 percent, and in the corridor as a whole it was 18 percent. Allowing for the fact that these percentages refer to exclusively native groups they are still unquestionably higher than the 1971 Census data, and may reflect rounding errors in the latter as well as lower proportions of respondents not stating an occupation in the Manpower survey.

The occupational data from the Gemini field surveys were not presented in terms of the occupational self-identifications of the respondents, but rather in terms of the man years devoted by employable native men to each type of employment situation in the communities surveyed. According to these data, in the Delta only 1.5 percent of the total man years of native male employment in 1972 were devoted to trapping. For the Middle Mackenzie this figure was 13.1 percent and for the Upper Mackenzie it was 1.5 percent. For the whole of the Mackenzie corridor Gemini estimated that 1.7 percent of the total native male employment activity was devoted to trapping.

These figures no doubt reflect some under-enumeration of trapping (no trapping at all was recorded for Ft. Providence or Ft. Franklin in the Gemini surveys) as well as the fact that there was substantial oil exploration employment during the year in question, 1972. However, to the extent that they are at all representative of trapping activity in the region, they suggest that quantitatively trapping is not of great significance, although qualitatively and symbolically I think it is quite another matter.

In his testimony before this Commission Dr. Asch argued essentially that wage employment was unnecessary and pernicious and that more traditional sources of income were more frequently preferred by native people and were preferable. Dr. Asch has done extensive field work in the Fort Wrigley area, one of the more traditional or conservative communities along the Mackenzie River. That no doubt explains the fact that much of what he said concerning attitudes toward trapping and wage employment is not in accord with much of the published literature for the Mackenzie River drainage, for the past 15 and more years. In terms of my reading, and rereading of this literature, almost every researcher who has seriously studied the situation of native people in the North during this period has described their increasing disinterest in trapping, and their increasingly expressed preference for wage employment. This is true of Clairmont's research in Aklavik in 1961, of Van Stone's research among the Snowdrift Indians in 1961, of Helm's research among the Lynx Point Indians, Welsh's research in Old Crow, Cohen's survey of the Indians of Fort Norman and Fort McPherson, Helm's research among the Dene at Ft. Simpson, Ft. Providence, and Ft. Rae, Chance's work among the Winisk Cree of Ontario, Hurlbert's research among the Hare Indians of Ft. Good Hope, and Helm and Lurie's research among the Dogrib Indians of Lac La Martre.

Van Stone noted this pattern fifteen years ago, during his field work among the Indians around Snowdrift which was at that time one of the more isolated, minimally acculturated

areas. He wrote: "Trapping is becoming increasingly unpopular with the Snowdrift Indians" (p. 20) and further

"As a concluding statement on trapping, it should be emphasized again that there seem to be few Indians who are very enthusiastic about trapping as a means of making a living. Most men feel it is very difficult to make any money trapping.... Nearly all informants felt that the only solution to this situation was steady wage employment, and almost to a man they maintained they would give up trapping at once if an opportunity for steady employment presented itself." (p. 24, in *The Changing Culture of the Snowdrift Chipewyan*, Ottawa, National Museum of Canada, 1965).

And more generally he wrote at a later date: "Since the great majority of Athapaskans no longer depend exclusively on the land as a source of subsistence and have lost much of their knowledge of the environment and how to exploit it, they are rapidly approaching a condition in which they are no longer adequately equipped to live in their ancestral territories."

In the same year that Van Stone was in the field with the Snowdrift Indians (in 1961) Clairmont found very much stronger indications of this same pattern among young natives in the much more acculturated communities of Aklavik and Inuvik. He wrote of Aklavik that "with the exception of 'bush' Eskimos, young native adults have no motivation for trapping (13)... young natives who live in the settlements do not want to assume the role of trapper." There were similar findings from a related study in Inuvik: "Most teenagers interviewed about trapping readily dissociated themselves from the role, professing total ignorance, when in fact many had had much experience with trapping... many do not trap even

when idle." He found the same pattern with respect to fishing and whaling: "settlement natives between the ages of 16 and 29 appear to be oriented to middle class values, and never go to these (fishing and whaling) camps, even if no other work is available" (16). As the government has learned, even the possibility of fairly high remuneration has not been sufficient motivation for this group.

Similarly, "the handicraft and fur-garment production (in the Aklavik Fur Garment Shop) largely involved older Eskimo females, and did not sufficiently motivate the younger, single, settlement Eskimos." Since many of these girls were unemployed, this is best explained, Clairmont suggests, as a consequence of "their rejection of traditional activities and of their aspirations for a 'better' style of life. Involvement in garment and handicraft work appears to represent to these females, a self-image they wish to avoid." Clairmont concludes that these young natives reject the whole range of traditional economic activities because they are associated "with a style of life which is alien to their new set of values." (From *Deviance Among Indians and Eskimos* in Aklavik).

Helm concluded from her work among the Dene:

"All factors, then, continue to operate to remove the Indian from the bush settlement and into the trading fort or white-focus community where opportunity for wage labor and access to white goods, services and subsidies is better. Only if some bush resource becomes exploitable, for example in the development of a lumbering or commercial fishing industry, can we expect the bush population to hold or increase in a particular region. But it must be recognized that should such

resources open they will be organized essentially through representatives and interests of the greater Euro-Canadian Society."

And Welsh wrote of Old Crow:

"The people of Old Crow have moved in barely three generations from a nomadic hunting life to direct involvement in most of the advantages and ills of the twentieth century. An old man who grew up in a skin lodge today listens to the radio and flies to the hospital. His sons have given up trapping and are operating power saws, outboard motors, snowmobiles, and even tractors. Many of his grandchildren are leaving Old Crow altogether to seek the attractions of metropolises such as Inuvik, Whitehorse, Vancouver and Edmonton. What does the future hold for Old Crow as a community, and for its people? Like other northern towns, Old Crow has a very shaky economic base. Unless fur prices go up dramatically, trapping will not be a viable way of life and unless oil is discovered in the area, the town cannot survive without massive government assistance. In such a situation the government may very well encourage the relocation of the population. As the years go by, even if the present economic situation does not materially change, the Indians will continue to become further and further removed from their natural surroundings, further and further removed from the bush, and more reliant on outside resources."

Hurlbert wrote of the younger people in Ft. Good Hope in 1961:

"With the influx of white population into the north during and after the World War II, they observed an even higher standard of living in which they wished to participate. After the fall in fur prices the desired standard of living was impossible. Today this group looks with dissatisfaction upon the bush life which most of them are forced to lead and conversely they are increasingly attracted to wage employment with its possibility for a more stable income and a better standard of living."

Cohen made "An Anthropological Survey of Communities in the Mackenzie-Slave Lake Region of Canada" in 1960. In Ft. Simpson he found that "the recent spate of building has attracted many Indians to the settlement for wage labor.... (However) there is still a sub-stratum of hunting, fishing

and trapping which underlies the local economy. Thus many of those who are working on construction are also tending their nets in the evening and quite a number told the writer that they intended to set traps this winter." This clearly describes the dual economy in that community for which Asch noted continuing evidence in the Gemini North materials.

Cohen described Ft. Norman as having:

"...a traditional economy by default. All persons spoken to wanted wage labor if possible with no reference to time off for hunting, fishing or trapping. However opportunities in town are rare, and as we have seen, the old hunting pattern maintains its desirability so that people may even leave a job to go to the mountains. Thus people claim they want jobs and would not leave work to hunt, etc., but in practice they are ambivalent about it."

By contrast, in Ft. Good Hope he found:

"...the economy of the area is primarily centered in hunting, fishing and trapping. Almost all non-white households have one or more nets in the Mackenzie and this forms the major source of food in the summer diet. Women snare rabbits and now and then a moose is shot.... For large game like moose, traditional sharing patterns are still practiced."

However, in a later 1963 publication Cohen concludes from field work in Ft. Good Hope that "very few of the adult males (of Ft. Good Hope) have not worked at wage labor at some time during their lives, and only a tiny minority say they would not take up wage labor if given the chance." And again, "As already noted, all Indians would prefer, if given the choice, to work as permanent wage employees. The scarcity of such jobs has so far limited their distribution to those whose need is greatest and/or those with the greatest degree of Southern Canadian education." (p. 40).

Of Fort McPherson Cohen wrote:

"...the government building programme in Ft. McPherson itself, as well as the rest of the Delta, has turned many people in the area towards wage labor. However this should not be taken too far. Indians still hunt, fish, trap; hunting parties still go out to the mountains in the winter, and sharing patterns for the meat of large game still obtain -- but cash income from wage labor is regarded by many as being more readily available, and more desirable than fur, which is at present thought to be too low in price."

In his summary discussion Cohen writes:

"...jobs are not in large supply around the settlement towns, but when construction and/or maintenance work expands, there is no dearth of applicants. Almost everyone agrees that wage labor is, generally speaking, more attractive today than traditional economic activity. However, the insecurity of this source of income for all but a few means that dependence upon older productive techniques has not ended."

He goes on to note that "an estimated 50 to 80 percent of the population of the settlement town areas is dependent to a large extent on hunting, fishing, and trapping for their livelihood." He continues "All adult males spoken to have worked for wages.... All claim they like to work for wages but only a few, notably at Ft. Simpson, expressed the desire to work for wages full time. More often people say (work) 'part of the time'."

Furthermore, with respect to the subsistence portion of the dual economy, an aspect which Asch emphasized heavily, Helm wrote in 1963: "Today the Bush Athapascan primarily seeks furs in order to obtain money to buy not only clothing, and general equipment but a substantial portion of his food as well." (p. 13). They "settle along waterways leading to the Fort rather than in the richest fish, flesh, and fur areas,

per se." (p. 13). "The fall Cariboo hunt of the Dogribs is today of more symbolic than economic importance." (p. 17) and she concludes:

"The long trend in the last 100 years or so has been to abandon subsistence activities in order to procure more furs for the money and market economy and to retreat from areas rich in subsistence biota for easier access to Point of Trade. Only Government subsidies through family allowance and old age pensions as well as outright relief has in recent decades allowed the Dene level of living to rise." (p. 19).

And Walsh writes (as of 1968) "Although the people of Old Crow continue to derive a fair portion of their diet from hunting and fishing, they have become increasingly reliant on White foodstuffs and material goods."

Following his survey of "White Dominant Settlements in the Canadian Northwest Territories" in 1962 Jacob Fried wrote that in these settlements, which included Inuvik, Hay River and Yellowknife, there are two groups, the traditional who until recently were involved in hunting and trapping, and the others, young men and women, aged 18 to 35 years "who now have some schooling, know no native skills, and are incapable of living off the land. However both are thoroughly committed to settlement life. Most of the younger persons appear to have already passed beyond the point of no return as far as adaptation to the older aboriginal mode of life is concerned."

Balikci found essentially the same pattern of preferences in his study of "Vunta Kutchin Social Change" among the Dene of Old Crow published in 1963.

Writing of The Subsistence Economy of the Dogrib Indians of Lac La Martre, based on field work done in 1959, Helm and

Lurie note:

"On the whole, the fur trade has never allowed the Northern Indian an adequate level of living by Euro-Canadian standards or by the developing desires and standards of the Indians themselves. Their consumer desires have always outstripped their financial resources. The advent of various government allowances and in recent years the unprecedented opportunities, unpredictable though they be, for wage work have opened new consumer horizons and have permitted a certain degree of economic security, and, especially, have fostered the outlook that a certain consumption level and degree of security is a right."

And again in the same report they write:

"The contemporary Dogrib no more wishes to return to the skin tent and dress than he wishes to return to the birch-bark canoe, if only in terms of escaping the unrelenting toil of yesteryear. As one old woman in her sixties put it, in describing her youth, 'Before, we were so very pitiful. We are just like ladies now.' The expanding cash economy, largely through the advent of wage work and government allowances, has allowed a standard of living that precludes a return to more aboriginal conditions or even, by choice, stabilization at the present living level. For this latter reason, it seems unrealistic, in terms of native consumer interest and standards, to encourage the Indian to adhere to or return to the fur trade economy and the bush life of his father's and grandfather's generation. To be a trapper only, many a bush Indian even today would have to submit to a decline in standard of living. He cannot visualize the possible detrimental consequences in social, familial and personal life that greater involvement in the market economy of Western society may bring, but he knows full well the security and pleasures of money in hand. And this knowledge brings even the prideful hunter and master of bush craft out of the bush to seek wage work."

Probably the most dramatic indication of the inadequacy of the traditional sources of livelihood available to many Northern natives in Canada, is seen in the earnest recommendations, by two of the most concerned and conscientious of students and friends of Northern peoples, as a solution to the situations of some of these Northern native peoples. Dr.

Diamond Jenness, the then dean of Canadian anthropologists working in the north, who had had 40 years of northern experience, urged that the Government should seriously consider relocating Northern peoples into southern Canada in 1961. And Dr. Peter Usher, who has appeared before this Commission several times, urged this same position strongly for the people of Coppermine and Holman Island in a 1965 publication. After commenting on the meagre resource base, and the "remarkable rate of population increase", Usher went on to write:

1.13 "Many southern Canadians retain romantic and sentimental notions about the north, and the Eskimos. They feel that the Eskimos have been ruined by the white man, who intruded upon their country and upset their ancient way of life; and hence we are responsible for restoring to them the ability to live decently in their homeland. We do indeed have responsibilities to the Eskimos, no less than to the rest of our fellow men. However, past mistakes cannot always be rectified. There may no longer be any sound basis for the existence of the Eskimo population as a whole in the Arctic. If so, the nation would not be discharging its responsibilities by condemning the Eskimos to a miserable existence on the barren grounds. The writer believes that the old way of life is gone forever, and that it is doubtful if even the Eskimos wish to return to it. There is nothing inherently virtuous about driving a dogsled and eating sealmeat; at least no more so than driving a taxi or managing a bank. Some may regret that so unique and hardy a race should be submerged into Canadian society, but there is probably little to be gained by attempting to prevent it. The urgent problem today is to ensure that these people are not condemned to exist for generations on the margins of our society. Continued research in the problems of habitability and improved resources use in the North is necessary, but much more effort should be directed toward the problems of Eskimo emigration. Here is work for the geographer and the anthropologist; to find an environment in which the Eskimos can successfully become self-sufficient members of Canadian society with a minimum of hardship during resettlement."

The purpose of quoting this statement by Usher is not, of course, to argue for what he felt driven to seriously

advocate at that time, but to emphasize the plight of the native people that he observed, given their dependence on the very limited renewable resources available to them. It hardly needs mentioning that the native populations are significantly larger now than when Usher wrote these words, and a generation hence they will be much larger yet.

The purpose of reading these many passages from reports of research conducted during the past 16 years is not only to document the general disinterest in trapping as contrasted with wage employment a decade and more ago. It is also to emphasize that a whole generation of native young people has grown up in communities where it was widely accepted that wage employment was quite preferable to trapping.

The Educational System

Not until the 1950's did the Federal Government really become involved in itself providing for the education of children in the North, and not until about 1960 did the government commit itself to providing education for all children in the Northwest Territories whose parents wanted it.

In my testimony in Inuvik I spent some time developing a critique of the educational system operating in the Delta. Virtually all of that critique is relevant to the rest of the Mackenzie corridor.

It must be strongly emphasized that, as contrasted with the educational system instituted by the Danes in Greenland, the system in the Territories promoted replacement of the

native cultures by the white culture during the 1960's. This culture replacement policy, which was most flagrant during the 1960's and has since been mitigated, was seen throughout the Mackenzie corridor in four aspects of the educational process: the qualifications of the teachers, the language of instruction, the content of curriculum and the structuring of classroom interaction.

As I noted in Inuvik, the result of this approach to education was that children who attended school for very many years, particularly residential schools, were effectively unfitted for many traditional activities in terms of skills learned, motivation, and exposure to hardship. As Clairmont's research showed, most of the young native people of Aklavik and Inuvik 15 years ago reflected the impact of this kind of education in their disinterest in traditional employments. The developments of the past 15 years, as well as such occupational data as are available, make it quite sure that there has been no reversal of this trend since then.

There are unfortunately no recent data on the educational attainments of residents of the Mackenzie corridor, much less on the current education attainments of native residents. Probably the most accurate data available are those from the 1969 Territorial Manpower Survey which found that 38.5 percent of native people in the area had never attended school, 13 percent had completed grades one to four, 32.5 percent had completed grades five to eight, and 15.5 percent had completed grades 9 to 12. During the period 1969

to 1971, there was a vast increase in the number of Inuit and Indian children enrolled in schools in the Northwest Territories, according to figures supplied in the Annual Report of the Commissioner of the Northwest Territories. There no doubt has been an equally large increase in the enrollments of Metis children, although this cannot be documented since data on Metis children were combined with data on white children.

Canadian Census data for 1961 and 1971 further substantiate the picture of rapidly increasing educational attainments among native children in the Northwest Territories in recent years.

The Boreal Institute of the University of Alberta projected the number of native young people in the Mackenzie area who would probably receive a high school or vocational school diploma between 1969 and 1984. They used as their data base the DIAND Manpower Survey of 1969, extrapolating the dropout rates inferred from these data to student behavior for the subsequent 25 years. A consequence of this procedure was that the pattern of high dropout rates found among native youngsters in the Northwest Territories before 1969 is projected forward, resulting, as the Boreal Institute report notes, in "projections probably representing a lower bound, and the actual numbers could be substantially higher."

In terms of this projection, the numbers of Mackenzie area Inuit, Indian and Metis graduates of high schools and vocational schools would be expected to increase from 36 in

1969, to 51 in 1974, to 68 in 1979, to 77 in 1984. While these figures are certainly not impressive, the projection technique, as indicated, was a conservative one, and I would anticipate that native young people in this area will in fact graduate in distinctly higher numbers. Unfortunately, it is not possible to check on the accuracy of the 1974 projection, because the Department of Education no longer compiles statistics according to ethnic category.

The cumulative picture is a more impressive one, however. By 1969 there were 247 native graduates of technical, vocational, or high schools in the Mackenzie area. Assuming that the projections from 1970 to 1976 are accurate and that none of the earlier graduates died, that number will double this year to 492 graduates, and in five years it will increase to 720 graduates.

The effects of the cultural replacement emphasis in education are clearly seen in the findings of Smith's 1967 survey of the employment interests and occupational aspirations of Indian, Inuit, Metis and white students enrolled in grades 7 through 12. Data are available from this survey for Yellowknife and for the Delta. Since I discussed the findings of that survey in detail in Inuvik, I will simply reiterate the key findings.

Smith first had his respondents rank the prestige of 48 occupations commonly encountered in the north. He explored the relationships between the rankings of the white, Inuit, Metis and Indian students and concluded that "each population

(or ethnic) sub-group was essentially similar to every other." The differences that did exist, according to Smith, were explained by the situation in the school which the pupils attended or, as he subsequently suggests, the place of the school, not by the ethnicity of the student.

Data on the five highest and the five lowest ranking occupational preferences of the Delta and the Yellowknife respondents show that generally it is the glamorous, and/or skilled jobs that are preferred. Data on the preferred conditions of employment show that Inuit, Dene, and Metis students from Yellowknife and from the Delta most frequently said they would prefer to work in large Northern towns, and least frequently said they would prefer to work on the land. The most preferred type of employer was the large corporation, mentioned by more than half of all the respondents, followed by a small private company. Self-employment was a rather close third. Most of the respondents said they would prefer to work both indoors and outdoors, and of the remainder more said they would prefer indoor to outdoor work.

A later replication of this study in other schools in the Northwest Territories yielded results very similar to those found for the Delta and the Yellowknife samples.

Smith concludes:

"...that, ethnic differentiation in northern Canada accounts for little differentiation in evaluations of occupations. Rather, evaluations of occupations by the various ethnic groups are remarkably similar, especially where representatives of the ethnic groups examined come together in one place of schooling. This is interpreted to mean that the culturalist posi-

tion which assumes that ethnic groups in the North necessarily possess a residue of aboriginal cultural values and attitudes towards occupations incompatible with 'modern' attitudes and values towards such aspects of contemporary northern life as the occupational system, can safely be rejected. This does not say that there are no cultural differences between northern ethnic groups, even with respect to occupational evaluations; simply that (a) these cultural differences seem not to follow ethnic group boundaries but to cross-cut them in significant ways, and (b) that these cultural differences seem to have little to do with aboriginal derivation and much more to do with learned responses to common experience with social structural characteristics which transcend ethnic boundaries." (p. 20).

Concluding Remarks

Mr. Commissioner, that concludes my testimony on this overview statement. In the interests of brevity, I have refrained from including in the formal submission the various tables that I constructed in the course of preparing this testimony. However, I have brought copies of them with me and am prepared to present them and to discuss them during the course of the cross-examination if requested to do so.

I am aware of the fact that a fair amount of what I have said is inconsistent with what you have heard in many of the community hearings. It is apparent that I have used sources, and in many cases have used the words of researchers who were writing before the pipeline discussions began. I do not want to be seen as contradicting the testimony of those who spoke in the community hearings. Those people spoke on the basis of their experience and their concern, and the hearings have profited from their willingness to come forward. However, I

do want to call attention to the fact that there are some other aspects of this large and complex Mackenzie Valley picture which were given little emphasis by many who spoke to you at the community hearings.

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A REVIEW OF SOCIO-ECONOMIC STUDIES

UNDERTAKEN BY

CANADIAN ARCTIC GAS STUDY LIMITED

by

W. B. TRUSTY

PRESENTED TO

MACKENZIE VALLEY PIPELINE INQUIRY

A REVIEW OF SOCIO-ECONOMIC STUDIES

UNDERTAKEN BY

CANADIAN ARCTIC GAS STUDY LIMITED

Mr. Commissioner, in order to complete the background for the more detailed testimony that is to follow, I would now like to review, in broad terms, the various socio-economic studies that have been undertaken and submitted by the Applicant. Rather than focusing on the details at this stage, I am simply going to review the intent and nature of each study, and explain how the studies relate to each other.

Prior to the 1972 merger, both the Northwest Project Study Group and Gas Arctic Systems had commissioned research and related activities in the socio-economic area. The Northwest Project Study Group commissioned work in 1971 by the Boreal Institute for Northern Studies at the University of Alberta while Gas Arctic Systems retained Gemini North Ltd. When the merger took place, the contracts were assigned to Canadian Arctic Gas Study Limited and the studies and related activities were continued.

The Boreal Institute was retained to develop a plan for the recruitment and training of northerners in the operational phase of the pipeline. However, a related responsibility was to provide an analysis of aspects of the social and economic impact of the pipeline on northern communities, together with recommendations aimed at minimizing any disruptive influences resulting from

pipeline construction and operations. The study also undertook to provide descriptive statistics of the indigenous population of the District of Mackenzie.

The complete report of the Institute was filed by Arctic Gas as an Appendix to Section 14(f) which deals with the Northern Training Programme. The report is divided into three main parts. Part I deals specifically with the recommended strategy for recruitment and training procedures and is therefore more directly relevant to the testimony that will be presented by NORTRAN.

Part III deals with actual and projected conditions in the Mackenzie District in terms of certain key demographic and economic characteristics. In compiling this statistical profile, the Institute selected variables which, in their judgement, have a bearing on the possible impact on native people of involvement in pipeline construction and operation. The variables selected were the population distribution, gross manpower, educational attainment, residential mobility, occupational distributions, and income distribution. These variables were all cross-classified by age, sex, ethnic group and community. Since the base data was drawn primarily from the 1969 Manpower Survey of the Department of Indian and Northern Affairs, much of the purely statistical information is now out of date. However, many of the basic trends and relationships, as well as some of the comments of the Institute, are still relevant. In addition, of course, the statistical

analysis served as a basic building block for the recommendations with respect to recruitment and training.

The portion of the Boreal report that is most relevant to our testimony in this phase is Part II entitled "Some Aspects of the Social and Economic Impact of the Proposed Pipeline". Part II is divided into three sections, the first of which deals with the social and economic climate of the region, including such considerations as the effects of employment during earlier development projects in the region, current perceptions of wage employment, and the attitudes of northerners toward the pipeline. The second section contains recommendations for action which will minimize any negative social and economic impact. The third section is of particular interest in that it deals with the findings of a survey of the opinions of educated young northerners concerning the proposed pipeline.

These sections of the Boreal report had a direct bearing on the preparation of the Arctic Gas socio-economic impact statement, as well as on the formulation of a number of the policy intentions or preferences that have been adopted. As a result, we will be dealing at least indirectly with the Boreal material as we get into the detailed evidence.

Gemini North was originally retained in 1970 to undertake work relative to a northern pipeline. The initial assignment was

to provide information concerning communities, the system of government, and any regulations that would pertain to a northern pipeline. In addition, the initial work included the organization and implementation of a programme of community visits.

After the merger, the scope of the Gemini work was expanded to include the preparation of a major socio-economic impact study incorporating the earlier research and community liaison activities. That effort ultimately resulted in the preparation of a 7-volume report that was published by Arctic Gas in May 1974.

Gemini also contributed to a study on alternate modes and systems of transportation and to a determination of the economic feasibility of supplying natural gas to various Mackenzie Valley settlements. The results of these separate assignments are reflected in Section 14(e) of the Arctic Gas application and in the report entitled Impact of Proposed Arctic Gas Pipeline on Energy Costs in Northern Communities which has been filed with this inquiry. In addition, Gemini carried out a continuous review of Arctic Gas plans regarding route and facility locations, and construction, operations and maintenance procedures to determine potential socio-economic impacts and to provide advice to Arctic Gas personnel with respect to those plans.

The main objectives of the major study were to identify potential impacts, whether beneficial or adverse, and "to indicate methods by which the proposed pipeline and associated developments might contribute to the orderly development of the Canadian north by maximizing net economic and social benefits to northerners". As I mentioned earlier, the final report comprises 7 volumes. Volume I includes the introduction, the scope and the methodology employed. Volume 2 contains the baseline data and other information on the political, social, demographic and economic characteristics of the region. This material was compiled in terms of the past evolution of the region, the current situation and anticipated development in the absence of a pipeline, and constitutes the basic foundation required to meet the objectives.

With regard to the development of baseline data, a major problem faced by Gemini was the lack of a consistent data base for the Northwest Territories in general, and particularly for the study region. Another constraint was the fact that most Statistics Canada figures, or national averages with respect to such basic factors as income levels or housing densities, do not apply to the North. As a result, a substantial part of the research effort involved the generation and primary analysis of basic social and economic data. This made it necessary to undertake extensive field research in the communities of the study region. In particular, three main data collection and informational field programmes were organized and carried out in August 1972, in February and March

1973, and in October 1973. The statistical information that was gathered as a result of these field programmes was supplemented by published information and by extensive interviews with government and industry officials and with residents of the northern communities.

In general, research related to the main socio-economic impact study was combined with and dependent on the programme of community visits that were discussed earlier. In fact, as Gemini points out in the introduction to the report: "A most important aspect to our research approach was to involve northerners in the data collection process and to discuss our interpretations of the data with residents of the region on a continuous basis". The report goes on to note that this approach served two purposes:

1. It enabled many residents to become aware of the project and of the nature and findings of the study; and,
2. It enabled Gemini to verify, clarify and avoid misinterpretations of observed data.

Volumes 3 through 5 of the report deal with the impacts anticipated by Gemini in relation to employment generated by the pipeline and associated developments, the industrial base of the Mackenzie Valley, and traditional economic activities. Volume 6 is a summary volume which includes recommended policies and procedures to ensure the maximization of net benefits, while Volume 7 includes a number of appendices. I should note that, in

addition to the baseline data discussed earlier, Volume 2 also includes Gemini's general observations and anticipated impacts with respect to sub-regional population, the development of individual communities, and a variety of social factors.

As I mentioned, the Boreal Institute study was completed and the report finalized in October of 1972. While the Gemini report was not published until May of 1974, drafts were being reviewed in late 1973 and all drafts were in the hands of Arctic Gas by January 1974. It was at that time that preparation of the Arctic Gas socio-economic exhibit was undertaken. The exhibit -- Section 14.c -- was subsequently filed in March of 1974.

Section 14.c is divided into 5 sections, the first of which is simply a brief description of the objectives, the organization of the report, and the study region. The second section contains an examination of social and economic background considerations, including some of the historical influences, the perceptions of Arctic Gas with respect to attitudes toward the pipeline, and the need for development. Section 3 deals with the current and anticipated socio-economic situation in the absence of the proposed pipeline and related developments. This provides a basis for the examination and assessment of the impact of the proposed pipeline which appears in Section 4. The last section of the report includes a discussion, in broad terms, of the Applicant's policy intentions or preferences. Finally, there are some supplementary appendices which include methodological details and additional data.

There are several points with regard to the intent and basic approach of the Arctic Gas socio-economic impact statement that warrant some discussion at this time.

The first point that should be noted is that, to a large extent, the report was prepared in response to the Government guidelines, particularly the social guidelines. In fact, the guidelines constitute the basic requirement for a formal socio-economic filing by an Applicant.

In addition to responding to the guidelines, the intent in Section 14.c was to put forward the Applicant's perceptions and opinions with regard to the socio-economic circumstances of the region and the impacts of the pipeline. These perceptions and opinions were formulated on the basis of a review of all of the available source documents, including the Boreal and Gemini reports. However, only in a few specific cases is it possible to cite a specific source as the main basis for a particular conclusion. Rather, the conclusions reflect a synthesis of the material that was available.

Given the basic objectives to be satisfied by the socio-economic impact statement, a conscious decision was made to include only the essential elements that underlie particular conclusions or positions, without duplicating the very comprehensive coverage of topics in Gemini and the other source documents. In part, this decision reflected the fact that all of the source documents were

being made available for public scrutiny and there was therefore nothing to be gained by duplication or repetition of material.

In addition, the decision on the scope of the material presented in Section 14.c reflected a basic position with regard to the obligations and responsibilities incumbent on an Applicant with respect to formal application documents.

It is reasonable for people to assume that any material included in formal application documents is accepted by the Applicant and that the Applicant has relied on it to reach certain conclusions. By way of contrast, consultant reports that an Applicant makes available to the public can be prefaced with a disclaimer that makes it clear to any user of the document that the opinions and conclusions expressed therein are those of the consultant and do not necessarily reflect the views and opinions of the Applicant.

In the socio-economic area, this question of the responsibility of the Applicant requires an added degree of caution. In part this reflects the very subjective nature of this type of analysis. More important however, is the caution that must be exercised with respect to the quantitative aspects of socio-economic analysis.

In the introduction to Section 14.c, the following statement is made:

"A note of caution is warranted with respect to the interpretation of the statistical aspects of the exhibit: the inadequacy of statistical data and the state of the art with respect to quantitative socio-economic analysis preclude the development of definitive quantitative estimates of a variety of the potential impacts. As a consequence, in the view of the Applicant, the quantitative estimates would be considered to be indicative of the nature and the direction of impacts which are discussed qualitatively, rather than being a precise definition".

Even with this disclaimer, the exhibit is very restricted in terms of the extent of quantitative material that is presented.

This degree of caution in the Arctic Gas exhibit may seem inconsistent with the extent of quantitative analysis and the sometimes complex and seemingly precise calculations contained in the various consultant reports and government studies. It may appear that either Arctic Gas is being unduly cautious or that the analysis and estimates contained in other reports are not reliable and therefore not very useful. In fact, in my opinion neither proposition is correct.

There are several considerations with regard to quantitative socio-economic analysis that explain the apparent inconsistency and that are important to the interpretation and use of statistical information. The first and perhaps most important consideration is the adequacy of the data base. I have already noted that a major problem faced by Gemini was the lack of a consistent data base for the study region -- a problem that is compounded by the fact that southern averages and statistical rules of thumb do

not apply in the north. As a result, a considerable part of the Gemini activity was devoted to the generation of basic data. Since then a great deal of additional data has become available, particularly as a result of the ongoing studies and data collection efforts in government. However, it is probable that for the foreseeable future we cannot expect the adequacy of basic data to reach a level comparable to that in southern Canada.

I should note that to a large extent, the data inadequacies reflect basic structural factors that can be expected to change only slowly. In other words, the problem is not simply one of the amount of research or data collection effort that is expended.

A second consideration in quantitative socio-economic analysis is the size of the statistical base. By the term statistical base I mean the total population or other parameter that is of interest. In general, the smaller the statistical base, the more important it is that there be accurate data and precision in calculations. In part this reflects the fact that with a relatively large statistical base, random errors and other factors tend to be offsetting and there is convergence around averages that are meaningful. The reverse situation occurs when the statistical base is small.

In addition, the smaller the statistical base, the more important are absolute numbers, as opposed to ratios. For example, there is a considerable difference between the construction of 50 new houses in a town of 500 people and a city of 500,000.

This rather obvious fact translates into an important principle: when the base is small, any given change or decision has a disproportionate effect or influence and can therefore invalidate statistical analyses or conclusions that preceded the change or decision.

A related consideration is the fact that when the statistical base is small, the value of statistical rules of thumb or relationships is greatly reduced. In connection with the Gemini report I mentioned the fact that southern rules of thumb do not apply in the north. Here I am raising a question about the use of any rules of thumb. The essential point is that in a situation where the base is small, one should not use general information and observations to reach specific conclusions. Rather, each situation or problem must ultimately be handled on an individual case-by-case basis.

I would like to note one additional implication of the points that have been raised, particularly the principle that I referred to as disproportionate influence or effect, and the related need for a case-by-case approach to reach specific conclusions.

While these considerations have a bearing on the treatment of a particular situation at a given point in time, they have a more critical bearing on the treatment over time. In other words, these considerations are critical in terms of the problem of being

able to make sufficiently accurate predictions -- a problem that is more severe when the statistical base is small. In my opinion this argues strongly for flexibility in our approach to pipeline impacts and related measures that might be instituted to maximize the net effects. It seems to me that it is most important that we establish appropriate mechanisms and procedures and that there is a great danger in establishing rigid or very specific measures at an early date and on other than a case-by-case basis. I should emphasize that here I am talking about measures oriented to the communities and the people of the region, where the dynamics of the situation will be most critical. It was primarily this factor that led Arctic Gas to recommend in Section 14.c the formation of a liaison group to deal with regional socio-economic matters.

While the considerations that I have outlined underlie the very cautious approach taken in the Arctic Gas exhibit itself, it is not my intention to denigrate the quantitative material contained in consultant reports and government studies. Certainly, there may be cases where too much confidence is placed in statistical measures, or where calculations are made that are not warranted by the quality of the basic data. Furthermore, the apparent precision and seemingly scientific nature of a statistical analysis can be misleading and can cause people to place too much reliance on the conclusions that result.

In general, however, such analyses serve a very useful function provided that they are assessed and interpreted from the perspective of the specific objectives that the calculations are designed to meet.

An appreciation of the specific objectives is particularly vital to a determination of the value of an analysis in the case of quantitative impact assessments and predictions, as opposed to purely descriptive analyses. For the most part, specific calculations are not undertaken in order to make a precise or definitive estimate of a given type of impact. Rather, they are intended to establish ranges, orders of magnitude, the relative significance of impacts, and sensitivity to planning or policy options or alternatives. Within this kind of framework, the precision or ultimate accuracy of an estimate is of lesser importance.

For example, if the objective of a calculation is to determine whether or not a particular community will be adversely affected by population growth induced by a project, and if parameters have been established to determine what constitutes an unacceptable growth, it is not necessary to have a precise estimate. In that case it is only necessary to have orders of magnitude established with sufficient precision to determine whether or not the acceptable level of population growth would be exceeded. Similarly, if the objective is to determine the effects of alternative policy or planning options, calculations may only need to be taken to a level of precision sufficient to determine the relative magnitudes of impacts.

Another important point that must be noted is that, depending on the specific objective, analysts frequently will intentionally make under- or over-estimates in order to provide a margin of safety or to be conservative in the face of uncertainty. As a consequence,

essentially the same calculation may be made from different perspectives and yield very different results.

A good example of this type of consideration is the selection of an employment multiplier in Section 14.c as compared to the multiplier in the van Ginkel study. The objective in Section 14.c was to provide an estimate of the potential employment opportunities that would be generated by the pipeline and related activities. In order not to overstate this aspect of pipeline impact, a very low employment multiplier was intentionally selected.

In the case of the van Ginkel analysis, one objective was to assess the potential building requirements that would be induced in communities. Considering the fact that such requirements could be perceived as a negative effect of the project and that severe penalties can result from using an underestimate of building requirements for planning purposes, the van Ginkel analysis was predicated on a very high multiplier in comparison to that used in Section 14.c.

While the selection of both multipliers was based on a reasoned assessment of a variety of factors, in neither case was it the intention to put forward the multiplier or the estimate of induced employment as a best guess of the impact that will actually prevail.

The problem that arises with quantitative analysis of the type that I have described is that people attempt to attach more meaning

to estimates than is warranted and to interpret results without recognition of the specific objectives. The multiplier used in Section 14.c is clearly too low if one is concerned with impacts other than induced employment. It would be equally incorrect to assume that the multiplier would apply to a community such as Inuvik when it was intended to be applied on a regional level.

I have devoted a significant amount of attention to statistical matters because I feel that a great deal of misunderstanding arises in that area. Furthermore, it is probable that quantitative estimates, or predictions of impacts, will be central to much of the testimony and cross-examination in this phase. I felt that it would be helpful, therefore, to outline the more important considerations that, in my opinion, should underlie statistical analyses and the interpretation of results.

Turning again to the review of studies that have been undertaken, there is one other aspect of the approach in the Arctic Gas socio-economic impact statement that I would like to cover.

The organization of the exhibit makes explicit the "without pipeline" versus "with pipeline" approach that is fundamental to all impact evaluations. Since the "without pipeline" projections provide a base case against which pipeline impacts are assessed, they constitute the basic foundation for the analysis. As is generally the case with such studies, the foundation is itself predicated on certain judgements and assumptions. While others may

differ with the specifics, such judgements and assumptions ultimately must be made in order to establish a basic perspective and to impose a degree of stability for the analysis. In particular, they are made necessary by the potential for specific decisions or unforeseen influences to alter the base -- a consideration that I discussed earlier.

In Section 14.c, the "without pipeline" projections were predicated on the following points:

"Given the availability of markets, and the apparent potential of the region, the Applicant is of the view that the best means of providing the needed employment is through development based on the region's indigenous resources".

"...the Applicant is unaware of any indigenous natural resource with the exception of natural gas, that is susceptible of early development and that will have a timely and adequate impact in terms of the provision of needed jobs and economic opportunities..."

"...the assumption has been made that there will not be any significant economic development as a result of public sector investments during the period to 1985, other than those announced or being implemented".

The last of these points is clearly an assumption and nothing more. While the first two points are based on an examination of potentials and are subsequently supported in the discussion of various sectors, they must ultimately be viewed as judgements that underlie the projections. Stating them clearly allows others to properly assess and weigh the resulting estimates and conclusions.

The three points that I cited have a common characteristic -- they are all positive in the sense that they provide a more definitive base for projection purposes. This is an essential factor in the establishment of basic assumptions and judgements. Otherwise, the level of uncertainty associated with projections increases dramatically. For example, if the assumption that I cited with respect to public sector investments was eliminated, or if the converse assumption was used, it would be necessary to have information on the timing, nature, and scope of the investment. Without such details, there is not basis of assessing how the "without pipeline" situation might evolve. In general, these comments apply to any non-trend, or new, development influence: without sufficient details the potential influence must be eliminated by assumption or an overall judgement made as to its effect.

Following the filing of Section 14.c, Arctic gas embarked on a second major phase of socio-economic analysis which has continued up to the present time and is expected to continue into the future. The work leading up to the filing of Section 14.c basically provided an overview assessment of potential impacts and policy intentions. Subsequent work has been devoted to analysis of specific impacts at the individual community level, the ramifications of various policy options, and the details of individual policies. While some of this work has resulted in reports or documents that have been published, much of the work has been carried

out as an internal planning activity involving a direct interface of socio-economic consultants with other disciplines within Arctic Gas. The evidence of that internal planning effort will be presented in subsequent testimony.

As a first step in the new phase of activity, the Arctic Gas studies and government reports were reviewed to identify specific areas requiring more detailed examination. The key priority that emerged was the need to focus in more detail on the potential long-run physical impacts in communities and corresponding demands on the regional infrastructure, the local construction industry, and the resources of the communities and senior governments generally, as a result of the pipeline and related developments. It was our view that more information was needed in this area, not only from an impact prediction perspective but, more importantly, as a base for ongoing community and senior government planning efforts and for the further assessment of alternative policies and detailed planning by Arctic Gas.

Having made this determination, Arctic Gas retained the services of van Ginkel Associates Ltd., a Montreal based consulting firm with considerable experience in such fields as city planning, regional development, transportation, economic development, and the planning of social and educational facilities.

Concurrent with the development of specific terms of reference for the van Ginkel study, we also entered into detailed discussions with the three producing companies -- Gulf, Imperial, and Shell -- with regard to the socio-economic effects of the combined pipeline and gas field developments.

In the Gemini study and in the preparation of Section 14.c we had used estimates of producer employment prepared by a petroleum engineering consultant to Arctic Gas and filed as an appendix in Section 14.f. While those estimates were adequate for the purposes at that time, we felt that more detailed and definitive information should be developed as an input to the van Ginkel work. Furthermore, both Arctic Gas and the producers recognized that in the socio-economic area it is the combined development that matters and that an attempt to make a separation along corporate lines was somewhat artificial. While this principle is explicit in the Gemini studies as well as the Arctic Gas exhibit, it had not previously been carried to the extent of undertaking joint studies.

As a result of these discussions, it was agreed that the van Ginkel work would be sponsored jointly by Arctic Gas and the producers. In addition, it was decided to broaden the scope of the study to encompass more than the straight physical effects of the combined project. This was largely a reflection of the fact that the producers were facing the requirement of filing

materials with the Department of Indian Affairs and Northern Development, and therefore wanted the van Ginkel study to take a form that would make it useful as a source document for the preparation of their impact statement. The decision to broaden the scope had the added advantage that it allowed van Ginkel Associates to more thoroughly review social and economic factors that are interrelated with the physical development of communities.

The first step in the van Ginkel study was the development of a profile of the Mackenzie communities that are most likely to be affected by the proposed developments. This took the form of the atlas entitled Communities of the Mackenzie in which each community has been mapped to show the physical character of the community including the buildings, the relation to land and water, and vegetation. Included with each map is a set of descriptive statistics and other information which covers the general history of the community and its people, demography, economic structure, facilities and services, transportation and the physical plant. In addition, the atlas includes similar overview statistics and related information for the region as a whole.

In compiling this material, data and information from published documents and unpublished government sources was collected and reviewed for accuracy and consistency. In those cases where no basis existed for eliminating inconsistencies or differences between sources, data from more than one source is quoted in

order to provide a clear indication of the differences and ranges that prevail. To ensure as accurate mapping as possible, each of the communities was visited and a survey was made of all existing buildings, roads, and services.

The impact portion of the van Ginkel work resulted in the preparation of the report entitled Communities of the Mackenzie: Effects of the Hydrocarbon Industry. While the scope of that work was broadened to encompass such factors as the assessment of economic prospects and opportunities, the central focus remained one of assessing the physical implications of development in specific communities. Moreover, it was decided to make this assessment in terms of the long-run implications. Accordingly, calculations were made for the year 1985, by which time it was assumed that pipeline and gas plant construction, as well as major highway projects, would be complete. This decision was based primarily on the fact that the construction programmes will be completed in a relatively short period of time without making direct demands on the communities. However, the analysis does take into account employment, business opportunities, and associated income effects of pipeline and other construction in relation to community demands for housing and improved facilities and services.

Apart from normal population and labour force increases, the most important quantitative input to the study is the estimate of permanent employment opportunities in the hydrocarbon industry

and resulting induced employment opportunities. This reflects the fact that estimates of the type of employment and the number of people likely to be employed provide a basic indicator of the potential impact of a new activity in a region. The extent of the impact depends on both the location of the job and on where employees and their families live and spend their incomes. The question of residence is a particularly important consideration in the study region because the number of new employment opportunities is likely to exceed the capacity of the normal labour force with a resulting potential for in-migration to some or all of the communities. Alternatively, employers have the option of setting up a rotational system and encouraging southern workers to commute from residences in the south.

To evaluate the potential effects on communities, the van Ginkel analysis used a set of options that were designed to reflect the full spectrum of potential employment/residence patterns that could be created directly by the pipeline and hydrocarbon industry and indirectly as a result of induced employment opportunities. While actual circumstances could lead to a combination of patterns, the options in the study were intentionally structured to reflect distinct and independent alternatives in order that the implications could be properly identified.

For each option, estimates were made of the implied population

in each community in 1985. The options were then assessed in terms of such factors as the physical constraints to growth in individual communities and the capacity of the building industry, assuming that good standards of housing and community facilities and services are to be achieved. As a consequence of this assessment, the majority of options were eliminated and two were identified as both feasible and beneficial to the region.

The study also includes a community-by-community inventory of the services and facilities that could be achieved in 1985 under the conditions set by the maximum growth alternative of the two feasible options. It was not intended that these estimates be interpreted as a prediction that the maximum growth option will in fact prevail. Rather, the relevance of the 1985 service level estimates is to indicate, as a point of reference, the maximum levels of service that can be achieved under conditions of full employment and with all employees of the hydrocarbon industry resident in the region.

Following the completion of their study and the publication of the report in January 1975, van Ginkel Associates have continued their involvement with both Arctic Gas and the producers. For the most part, this involvement has not been directed to the preparation of formal reports. Rather, they have worked closely with me, with the Arctic Gas engineering staff, and with members of the producer socio-economic committee and have assisted in the evaluation and detailing of plans, procedures, and policies for

both construction and operations. The broad focus of the van Ginkel inputs has been on the ensuring that neither Arctic Gas nor the producers will be a burden on the communities and that opportunities for the pursuit of alternative lifestyles and development patterns will be preserved.

An example of the type of work that has been undertaken is the further evaluation of total potential building requirements in the larger communities and identification of alternative methods by which Arctic Gas and the producers can satisfy their requirements for operating facilities and housing. While this has ramifications for housing, transportation and other employment policies, it has particular relevance as an input to community planning efforts and as a base for the detailed discussions that will take place with communities and government during the pre-construction phase. In addition, there has been continued evaluation and refinement of logistics and construction plans, particularly with regard to the potential for an interface with communities. This has included consideration of such factors as the location of facilities in or close to communities, the movement of personnel to and from job sites, and the requirement for certain personnel to be resident in communities during construction, and the consequent provision of facilities.

While we will be addressing all of these matters in some detail during subsequent testimony, at this point I would like to stress the fact that these kinds of evaluations have been

undertaken on a day-to-day basis and have involved the cooperative efforts of a variety of people of different disciplines. Very often, the process involved discussion through which policies and procedures evolved, rather than written recommendations or formal documents. As a result, it is not always possible to be precise about the role played by one group or department as opposed to another, or about the criteria and weighting that led to a particular conclusion or decision.

While the main thrust of the van Ginkel work in 1975 and 1976 has been directed to the ongoing evaluation process that I have described, they did undertake one specific study that has resulted in the recent publication of a two-volume report entitled Building in the North.

During the course of the earlier work, it had become apparent that no comprehensive source was available describing problems and opportunities associated with building and community development in northern regions. This is unfortunate since the quality of life in northern communities depends so much on the quality of housing, community facilities and service. While the pipeline and related development offers an opportunity for improvement of housing and community facilities generally, improvement ultimately can only occur through an understanding of the physical and technical constraints and through careful planning. The two-volume report represents an effort to provide a basis for such improved understanding and for future planning.

Volume I of the study is an introduction to the conditions to which buildings and communities in the north must respond. Volume II is a compilation of building and planning experiences in cold regions in various parts of the world which constitute an attempt to respond to these conditions.

The report does not provide an exhaustive or definitive coverage, nor is it intended as a design manual. Rather, it is an introduction for architects to the engineering and technical considerations in northern building, and an introduction for engineers to the relevant architectural and social considerations. Further, it is intended for use by companies and government agencies that will be building in the Mackenzie and other northern areas in the next decade, and for the use of northerners who wish to gain an understanding of how the immediate man-made environment may be improved.

Mr. Commissioner, I have completed the review of studies that have been undertaken and submitted. Before concluding, however, I would like to comment briefly on two other aspects of the work carried on by Arctic Gas that are directly relevant to this phase of the hearings. First, I would like to note that beyond the studies, there has been substantial effort devoted to the whole area of employment policies and methods by which northern residents can be assured opportunities. This has included discussions with unions and investigation of training, orientation

and counselling procedures. For the most part, this activity has been directed by Mr. Hollands who will appear as a witness and provide details regarding what has been done and the current views, preferences and intentions of Arctic Gas.

Second, I would like to comment on the involvement of Dr. Hobart with Arctic Gas. While Dr. Hobart has not undertaken studies that have resulted in formal reports, he has made substantial inputs and will be testifying further.

As you are aware, Dr. Hobart had previously studied the employment programme operated by Gulf in Coppermine. In addition, he had been retained to do an evaluation of the NORTRAN training programme and was therefore familiar with the project and with some of the activities that were underway. Shortly after the first van Ginkel report was published in early 1975, we requested Dr. Hobart to review all of the relevant Arctic Gas studies and exhibits from the perspective of a sociologist. Subsequently, he has provided us with answers to questions that we posed regarding potential social effects of the project and related policy positions, he has made suggestions regarding orientation and other employment policies and practices, and has generally provided us with greater insight into the potential social effects of the project.

To facilitate these inputs and also as a part of the preparation

for his appearance here, Dr. Hobart has undertaken further research with regard to a number of social concerns. In addition, he considered the question of the potential social effects of not proceeding with the project. While some of his views and research results have already been presented in Inuvik and in his overview testimony here, Dr. Hobart will be presenting further direct testimony at a later stage.

To conclude, I should note that we have not structured the evidence that is to come around any particular study or document. While some aspects of the testimony will be drawn directly from specific sources, much of the evidence will reflect the work of the last two years that has not been included in formal reports. In general, it is our intention to emphasize our current views and intentions in the socio-economic area, and to focus particularly on those aspects that involve the development of more detailed information as compared to the exhibit and filed documents.

